



PROFESSIONAL II SERIES
OPERATIONS MANUAL

RESIDENTIAL FILTRATION SYSTEMS
WITH FLECK 2510 AIO CONTROL VALVE



MODEL NO. _____

SERIAL NO. _____

INSTALLATION INFORMATION

DATE INSTALLED: _____

MEDIA TANK SIZE: _____ "X _____ "

MEDIA INSTALLED _____ QTY

WELL PUMP CAPACITY: _____ GPM

PIPE SIZE: _____ " MATERIAL _____

SERVICE FLOW: _____ GPM

BACKWASH FLOW: _____ GPM

CURRENT WATER CONDITIONS AT STARTUP

WATER TEST RESULTS: IRON _____ PPM

WATER TEST RESULTS: MANGANESE _____ PPM

WATER TEST RESULTS: HYDROGEN SULFIDE _____ PPM

WATER TEST RESULTS: FEEDWATER pH _____

WATER SAMPLE INFORMATION

City Water Supply Private Water Supply FEEDWATER IS Clear Cloudy

OBJECTIONABLE CHARACTERISTICS OF WATER SUPPLY

- | | |
|--|--|
| <input type="checkbox"/> Water Seems Hard | <input type="checkbox"/> Water Has Sulfur Odor |
| <input type="checkbox"/> Water Makes Red Stains | <input type="checkbox"/> Water Has Other Bad Taste and/or Odor |
| <input type="checkbox"/> Water Makes Blue/Green Stains | <input type="checkbox"/> White Build-Up on Chrome Fixtures |
| <input type="checkbox"/> Water Looks Dirty/Cloudy | <input type="checkbox"/> Water Heater Coils Clog/Burn-Out |
| <input type="checkbox"/> Slimy Build-Up in Toilet Tank | <input type="checkbox"/> Other |

Introduction

The Aeration filter system functions as a regenerable water treatment unit utilizing oxygen instead of potentially harmful chemicals to rejuvenate and enhance the performance of the selective filtration media. The filtration media provided is specific to the water contaminant or contaminants your water treatment specialist has identified.

The Fleck 2510 AIO (Aerating Iron Oxidizer) Control Valve utilizes an air injection system to remove iron (ferrous or clear water), manganese, and sulfur from the water by both oxidation and filtration. Unlike other iron filter alternatives, the Fleck 2510 AIO technology is designed for use in a single tank and valve system configuration, reducing both initial and maintenance costs yet delivering years of trouble-free service. No chemical additives or air compressors are required for operation or regeneration with the Fleck 2510 AIO's unique and advanced design.

Do not use where water is microbiologically unsafe.

Installation Requirements

WATER PRESSURE: A minimum of 30 psi of water pressure (2.7bar) is required for regeneration valve to operate effectively.

CAUTION: Water pressure must not exceed 80psi (5.5 bars), water temperature is not to exceed 110°F (43°C), and the unit cannot be subjected to freezing conditions.

NOTE: Due to the air pocket, exceeding 80PSI will adversely impact performance.

ELECTRICAL FACILITIES: An uninterrupted 120 volt (A/C) supply is required. The valve is supplied with a 24vac transformer.

Please make sure your voltage supply is compatible with your unit before installation.

EXISTING PLUMBING: Condition of existing plumbing should be free from scale and iron buildup. Piping that is built up heavily with scale and/or iron should be replaced.

LOCATION OF OXIDIZER AND DRAIN: The oxidizing filter should be located close to a drain to prevent air breaks and back flow.

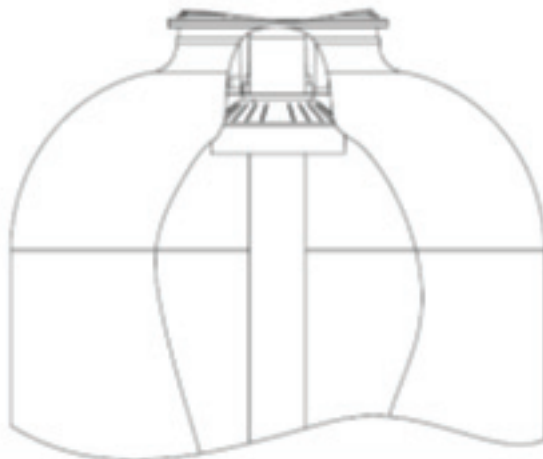
The oxidizing filter should be installed ahead of any water softeners.

BY-PASS VALVES: Always provide for the installation of a by-pass valve if unit is not equipped with one.

Installation Instructions

1. Place the oxidizer tank where you want to install the unit making sure the unit is level and on a firm base.
2. During cold weather, the installer should warm the valve to room temperature before operating.
3. All plumbing must be done in accordance with local plumbing codes. The pipe size for residential drain line should be a minimum of 1/2" (13 mm). Backwash flow rates in excess of 7 gpm (26.4 L/pm) or length in excess of 20' (6 m) require 3/4" (19 mm) drain line. Commercial drain lines should be the same size as the drain line flow control. **Due to the release of the air during regeneration, the drain line must be secured at the end, and anchored throughout the run.**
4. The check valve supplied with the valve must be installed at the valve inlet to prevent the pressurized air head in the oxidizer tank from venting backwards up the feed water plumbing.
5. If not factory installed assemble the deflector to the distributor tube.

Deflector Installation:



Put a thin layer of silicone lube around inside diameter of the deflector. Slowly slide the deflector over the distributor tube down about 1". When threading the AIO valve to the tank, the bottom of the threads will slide the deflector down. As shown above.

6. Lubricate the distributor O-ring seal and tank O-ring seal. Place the main control valve on tank.

Note: Only use silicone lubricant.

7. Solder joints near the drain must be done prior to connecting the Drain Line Flow Control fitting (DLFC). Leave at least 6" (15 cm) between the DLFC and solder joints when soldering pipes that are connected on the DLFC. Failure to do this could cause interior damage to the DLFC.

8. Teflon® tape is the only sealant to be used on the drain fitting. Do not use pipe dope or other compounds as they contain petrochemical elements and will attack the drain housing and cause failure.

9. Place the bypass valve in the by-pass position. Turn on the main water supply. Open a cold filtered water tap nearby and let run a few minutes or until the system is free from foreign material (usually solder) that may have resulted from the installation. Once clean, close the water tap.

10. Note this system is supplied without media installed for ease of transportation and simplifying site location. Refer to the section of this manual for Media Filtration installation Guide/Commissioning.

11. Plug unit transformer into an electrical outlet. Note: All electrical connections must be connected according to local codes. Be certain the outlet is continually powered (unswitched/uninterrupted).

CONTROLLER

NOTE: The electronic control is preset at the factory so that it will begin regeneration at 12:00 A.M. every third day. This ensures the right times for each step of the regeneration process. Under normal circumstances, these settings will not need to be altered and should not be changed.

The frequency and time of regeneration can be changed due to the following reasons:

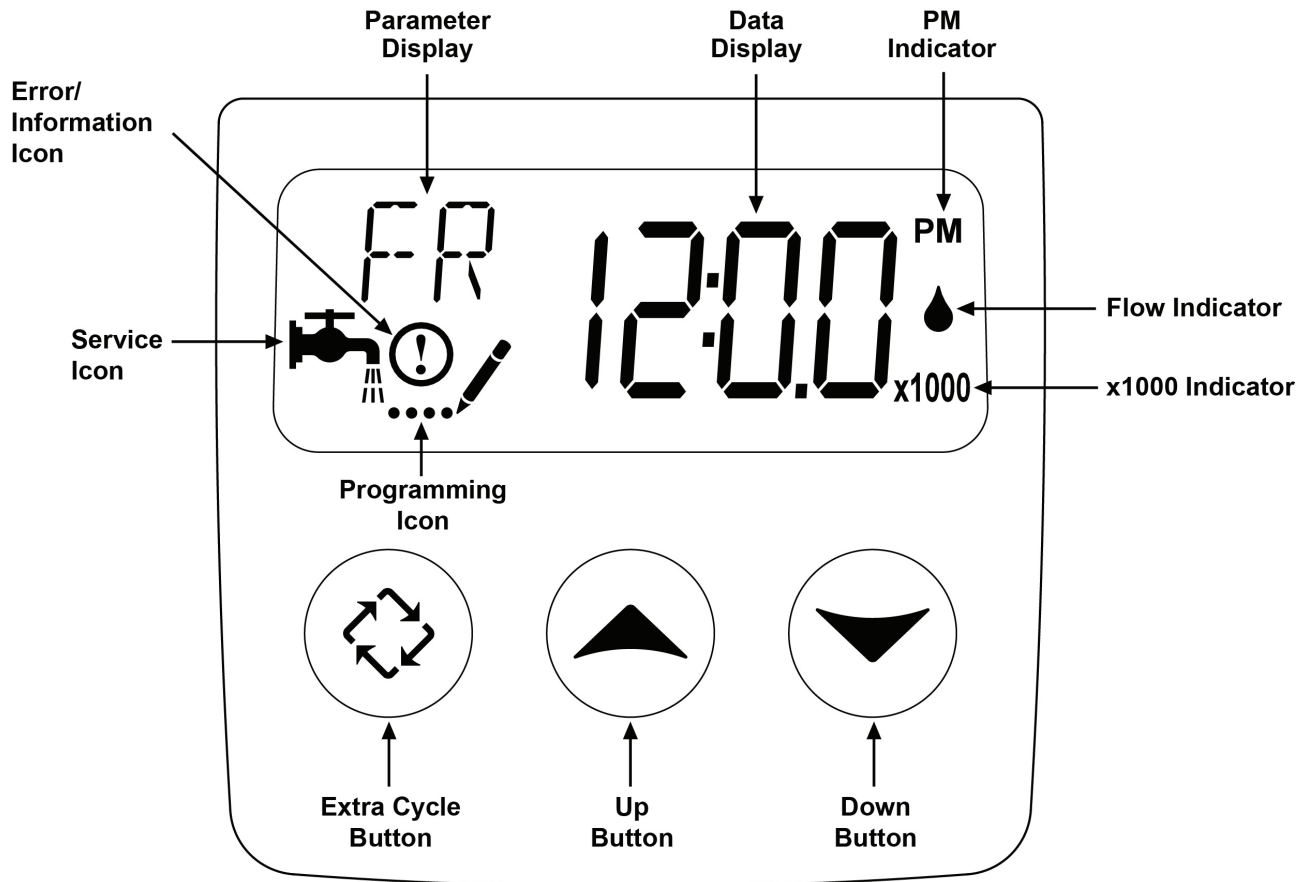
- A need for the unit to regenerate at a different time of day (DO NOT regenerate any other softener/filter at the same time as the AIO, since this will interfere with the regeneration process). Allow for a sufficient delay between the regeneration of equipment downstream of this filter for water recovery in low yielding wells.
- In conditions of high water usage and/or high levels of iron, the unit may need to regenerate more frequently than once every three days. The unit can be set for daily regeneration or to regenerate every two days. It is not advisable in most instances to set the regeneration frequency for a longer period than 3 days, as the filter medium can become fouled with iron, rendering the unit ineffective.

CONTROLLER

Timer Operation

In normal operation, the Time of Day display will alternate being viewed with the Days Remaining display. This display will be in gallons (options are liters or cubic meters). As treated water is used, the Days Remaining display will count down from a maximum value to zero or (- - -). Once this occurs, a regeneration cycle will be initiated at the Set Regeneration Time.

Water flow through the valve is indicated by the Flow Indicator that will flash in direct relationship to flow rate.



Time Clock Delayed Control (Factory Default Setting)

A Time Clock Delayed Control regenerates the system on a timed interval. The control will initiate a regeneration cycle at the programmed regeneration time when the number of days since the last regeneration equals the regeneration day override value.

Day of the Week Control

This control regenerates the system on a weekly schedule. The schedule is defined in Master Programming by setting each day to either “off” or “on.” The control will initiate the regeneration cycle on the days that have been set to “on” at the specified regeneration time.

Control Operation during Regeneration

During regeneration, the control displays a special regeneration display. In this display, the control shows the current regeneration step number the valve is advancing to, or has reached, and the time remaining in that step. The step number that displays flashes until the valve completes driving to this regeneration step position. Once all regeneration steps are complete the valve returns to service and resumes normal operation.

Pressing the Extra Cycle button during a regeneration cycle immediately advances the valve to the next cycle step position and resumes normal step timing.

Control Operation during Programming

The SXT control only enters the Program Mode with the valve in service. While in the Program Mode, the control continues to operate normally monitoring water usage and keeping all displays up to date. Control programming is stored in memory permanently, eliminating the need for battery backup power.

Control Operation during a Power Failure

The SXT includes integral power backup. In the event of power failure, the control shifts into a power-saving mode. The control stops monitoring water usage, and the display and motor shut down, but it continues to keep track of the time and day for a minimum of 48 hours.

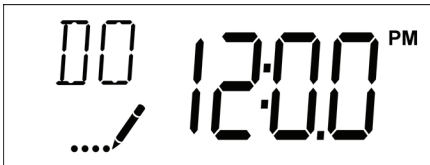
The system configuration settings are stored in a non-volatile memory and are stored indefinitely with or without line power. The Time of Day flashes when there has been a power failure. Press any button to stop the Time of Day from flashing.

If power fails while the unit is in regeneration, the control will save the current valve position before it shuts down. When power is restored, the control will resume the regeneration cycle from the point where power failed. Note that if power fails during a regeneration cycle, the valve will remain in its current position until power is restored. The valve system should include all required safety components to prevent overflows resulting from a power failure during regeneration.

The control will not start a new regeneration cycle without line power. If the valve misses a scheduled regeneration due to a power failure, it will queue regeneration. Once power is restored, the control will initiate a regeneration cycle the next time that the Time of Day equals the programmed regeneration time. Typically, this means that the valve will regenerate one day after it was originally scheduled. If the treated water output is important and power interruptions are expected, the system should be setup with a sufficient reserve capacity to compensate for regeneration delays.

Setting the Time of Day

1. Press and hold either the Up or Down buttons until the programming icon replaces the service icon and the parameter display reads TD.
2. Adjust the displayed time with the up or down button.
3. When the desired time is set, press and release the Extra Cycle button to resume normal operation. The unit will also return to normal operation after 5 seconds if no buttons are pressed.



Regeneration Options:

Queuing a Delayed Regeneration

1. Press and release the Extra Cycle button once. The service icon will flash to indicate that the regeneration is queued to occur at the next selected regeneration hour.
2. To cancel a queued regeneration, press and release the Extra Cycle button again. The service icon will stop flashing.

Regenerating Immediately

Press and hold the Extra Cycle button for five seconds.

1. The timer advances to Regeneration Cycle Step #1 (backwash), and begins programmed time count down. **Default Factory set at 14 minutes.**
2. Press and release the Extra Cycle button once to advance valve to Regeneration Cycle Step #2 (brine draw & slow rinse). **Default Factory set at 40 minutes**
3. Press and release the Extra Cycle button once to advance valve to Regeneration Cycle Step #3 (rapid rinse). **Default Factory set at 1 minute**
4. Press and release the Extra Cycle button once to advance valve to Regeneration Cycle Step #4 (brine refill). **Default Factory set at OFF**

Press and release the Extra Cycle button once more to advance the valve back to in service.

NOTE: Any regeneration cycle step can be advanced to the next step by pressing and releasing the cycle button

Regeneration Cycle (55 minutes):

Automatic Bypass during Regeneration

The filter is factory set to regenerate at 12:00 a.m., normally a period of little or no water use. The regeneration cycle lasts approximately 55 minutes, after which filtered water service is restored.

While the regeneration cycle is in progress raw water will automatically bypasses the filter if required. If possible, avoid using water during this time to prevent untreated water entering your household plumbing system.

The programmed regeneration time may be changed to accommodate households with varying schedules, however once set to meet water quality requirements the cycle duration times should not be changed.

1. Backwash (14 minutes):

During this cycle, the water carrying the iron runs to the drain. Untreated water is available during regeneration.

2. Air Recharge (40 minutes):

During this cycle, the unit empties water to drain and is recharged with air. The sound of air being recharged will be heard. Air bubbles should go down to the drain before proceeding to the next step. Adjust cycle time if necessary.

3. Rapid Rinse (1 minute):

During this cycle, water enters the tank, compressing the air into a pocket at the top of the tank.

4. Brine Fill (OFF)

SXT Programming Selections for Aeration Systems:

Note the system as supplied is preprogrammed to reflect all parameters listed below

Entering Master Programming Mode

Set the Time of Day display to **12:01 P.M.**

Press and release the Extra Cycle button (to exit Setting Time of Day mode).

Then press and hold the Up and Down buttons together until the programming icon replaces the service icon and the Display Format screen appears.

| Programming Abbreviation | Programming Definition | *Option Abbreviation | Option Definition |
|--------------------------|------------------------|----------------------|--------------------------------------|
| DF | Display Format | GAL | Gallons -12 hour time |
| VT | Valve Type | DF 1b | Downflow-Single Backwash |
| CT | Control Type | tc | Time Clock-Regenerates based on days |
| NT | Number of Tanks | 1 | Single Tank |
| DO | Day Override | 3 | Days between Regenerations |
| RT | Regeneration Time | 12:00 AM | Regeneration Time |
| BW | Backwash | 14 | Minutes for Backwash Cycle |
| BD | Air Draw | 40 | Minutes for Air Draw Cycle |
| RR | Rapid Rinse | 1 | Minute for Rapid Rinse Cycle |
| BF | Brine Fill | Off | Not a function used for this valve |

***factory default**

Exiting Master Programming Mode

Press and release the Extra Cycle button to accept the displayed settings and cycle to the next parameter. Press and release the Extra Cycle button at the last parameter to save all settings and return to normal operation. The control will automatically disregard any programming changes and return to normal operation if it is left in Master Programming mode for 5 minutes without any keypad input.

Refer to Fleck SXT Timer service manual 42713 for information on the following:

- Viewing Diagnostics
- Programming Options
- Troubleshooting
- Parts List

Media Filtration installation Guide/Commissioning

Consult Installation Instructions supplied with this system for equipment positioning and plumbing requirements.

Media filtration systems supplied by Blake Water Solutions are shipped without the media preloaded.

Aeration/Oxidation filtration media selected for Iron, Manganese, Hydrogen Sulfide removal or other conditions your equipment supplier has identified are dependent on many factors and are carefully selected and applied based on reported water conditions at the time of testing. Variables such as pH changes, changes in mineral concentration, unreported water contaminants as well as increased flow and usage rates may affect the performance of this system.

1. With the bypass valve in the bypass position disconnect the control valve from the bypass valve and remove the control valve from the mineral tank. Care should be exercised to avoid damage to the distribution tube and screen while loading the selected media for the application.
2. Plug the open end of the riser tube to ensure that no filtration media or gravel falls down into the riser tube. The riser tube should be firmly seated and centered in the tank and should be flush with the top of the tank opening (or tank top bushing if required). Underbed support gravel if required should be pre-rinsed to remove fines and grit which could clog the screens and then carefully loaded covering the distributor basket. Adding a sufficient amount of water (approximately 6" above the distributor) to the vessel prior to adding the gravel will minimize the potential for damage and help to level the support bed.
3. Next load the required amount of media selected for the application. Again, adding additional water to the vessel will assist in loading by minimizing dust and optimize leveling.
4. Unplug the riser tube, carefully position the valve over it and turn the valve into the threads in the fiberglass tank, tightening securely into tank and secure to the existing piping bypass.

Note: Ensure that the internal O-ring in the valve fits securely over the riser tube.

Silicone lubricant should be applied to the O-ring to ease installation of the riser tube.

DO NOT use petroleum based lubricants as they will cause swelling of O-ring seals.

5. The bypass valve supplied with the equipment should still be in the bypass position and the filter tank can now be completely filled with water by depressing the cycle button on the control valve to initiate backwash and slowly opening the bypass to fill the tank with water and purge any air. Once filled and purged of air the bypass should be returned to the bypass position. The valve controller can now be cycled back to the service position. This step will allow the media to absorb water and will reduce the chance of backwashing media out of the tank during the initial backwash on final start-up.

6. Once the media is sufficiently hydrated the system regeneration cycle should be initiated and the bypass valve slowly opened as the valve cycles into backwash. The backwash cycle should continue until the water runs clear. The valve can now be cycled to service and the bypass valve opened allowing treated water to enter the household piping.

Caution: most Medias including, but not limited to, Carbon, Filter Ag, and Chemsorb require hydration prior to being put into service as they are shipped dry. A minimum of 4 hours presoak, but preferably overnight saturation is recommended to condition any newly installed media for service.

Disinfect as detailed under System disinfection sheet **P/N SYSDIS**.

Note: Some filtration media such as Birm® have a low tolerance for chlorine or other disinfectants and therefore sanitization concentrations should be carefully monitored. Consult the specific media bulletins including the Material Safety Data Sheet or contact Blake Water Solutions if in doubt. Follow by an extended backwash to remove fines and until the backwash water runs clear. The system is now ready for service.

TROUBLESHOOTING

ERROR CODES

NOTE: Error codes appear in the Service Display

| ERROR CODE | ERROR TYPE | CAUSE | RESET AND RECOVERY |
|-------------------|-------------------|--|---|
| 0 | Cam Sensor Error | The valve drive took longer than 6 minutes to advance to the next regeneration position. | <p>Unplug the unit and examine the powerhead. Verify that all cam switches are connected to the circuit board and functioning properly. Verify that the motor and drive train components are in good condition and assembled properly. Check the valve and verify that the piston travels freely. Replace/reassemble the various components as necessary. Plug the unit back in and observe its behavior. The unit should cycle to the next valve position and stop. If the error re-occurs, unplug the unit and contact technical support.</p> |
| 1 | Cycle Step Error | The control experienced an unexpected cycle input | <p>Unplug the unit and examine the powerhead. Verify that all cam switches are connected to the circuit board and functioning properly. Enter Master Programming mode and verify that the valve type and system type are set correctly with regard to the unit itself.</p> <p>Step the unit through a manual regeneration and verify that it functions correctly.</p> <p>If the error re-occurs unplug the unit and contact technical support.</p> |
| 2 | Regen Failure | The system has not re-generated for more than 99 days(or 7 days if the control type has been set to Day-of Week) | <p>Perform a Manual Regeneration to reset the error code.</p> <p>If the system is metered, verify that it is measuring flow by running service water and watching for the flow indicator on the display.</p> <p>If the unit does not measure flow, verify that the meter cable is connected properly and that the meter is functioning properly.</p> <p>Enter a Master Programming Mode and verify that the unit is configured properly.</p> <p>As appropriate for the valve configuration, check that the correct system capacity has been selected, that the day override is set properly, and that meter is identified correctly.</p> <p>If the unit is configured as a Day-of- Week system, verify that at least one day is set ON.</p> <p>Correct the settings as necessary.</p> |
| 3 | Memory Error | Control board memory failure | <p>Perform a Master Reset and reconfigure the system via Master Programming Mode.</p> <p>After reconfiguring the system, step the valve through a manual regeneration.</p> <p>If the error re-occurs unplug the unit and contact technical support.</p> |
| UD | Upper Drive Synch | Power failure install programming change | Valve will automatically recover |

BLAKE WATER SOLUTIONS



| Tank Diameter Inches | Tank Diameter Sq. Ft Bed Area | Cubic Ft. per Inch of Height | Dome Volume Cubic Ft. | EQUIVALENT FLOW RATE IN GALLONS PER MINUTE | | | | | | |
|--|-------------------------------|------------------------------|-----------------------|--|-------|-------|--------|-------|-------|-------|
| | | | | PER SQUARE FOOT OF BED AREA | | | | | | |
| | | | | 3 GPM | 5 GPM | 8 GPM | 10 GPM | 12GPM | 15GPM | 20GPM |
| ACTUAL FLOW REQUIRED TO ATTAIN EQUIVALENT FLOW | | | | | | | | | | |
| 6" | 0.196 | 0.016 | 0.015 | 0.6 | 1 | 1.6 | 2 | 2.4 | 2.9 | 3.92 |
| 7" | 0.267 | 0.022 | 0.02 | 0.8 | 1.3 | 2.1 | 2.7 | 3.2 | 4 | 5.34 |
| 8" | 0.349 | 0.029 | 0.03 | 1 | 1.7 | 2.8 | 3.5 | 4.2 | 5.2 | 6.98 |
| 9" | 0.442 | 0.037 | 0.05 | 1.3 | 2.2 | 3.5 | 4.4 | 5.3 | 6.6 | 8.84 |
| 10" | 0.545 | 0.045 | 0.08 | 1.6 | 2.7 | 4.4 | 5.5 | 6.5 | 8.2 | 10.9 |
| 12" | 0.785 | 0.065 | 0.14 | 2.4 | 3.9 | 6.3 | 7.9 | 9.4 | 11.8 | 15.7 |
| 13" | 0.922 | 0.077 | 0.17 | 2.8 | 4.6 | 7.4 | 9.2 | 11.1 | 13.8 | 18.44 |
| 14" | 1.07 | 0.089 | 0.22 | 3.2 | 5.4 | 8.6 | 10.7 | 12.8 | 16.1 | 21.4 |
| 16" | 1.4 | 0.12 | 0.32 | 4.2 | 7 | 11.2 | 14 | 16.8 | 21 | 28 |
| 18" | 1.77 | 0.15 | 0.61 | 5.3 | 8.9 | 14.2 | 17.7 | 21.2 | 26.6 | 35.4 |
| 21" | 2.41 | 0.2 | 0.88 | 7.2 | 12.1 | 19.3 | 24.1 | 28.9 | 36.2 | 48.2 |
| 24" | 3.14 | 0.26 | 1.34 | 9.4 | 15.7 | 25.1 | 31.4 | 37.7 | 47.1 | 62.8 |
| 30" | 4.91 | 0.41 | 2.55 | 14.7 | 24.6 | 39.3 | 49.1 | 58.9 | 73.7 | 98.2 |
| 36" | 7.07 | 0.59 | 4.44 | 21.2 | 38.4 | 56.6 | 70.7 | 84.8 | 106.1 | 141.4 |
| 42" | 9.62 | 0.8 | 5.32 | 28.9 | 48.1 | 77 | 96.2 | 115.4 | 144.3 | 192.4 |
| 48" | 12.6 | 1.05 | 7.83 | 37.7 | 63 | 100.8 | 126 | 151.2 | 189 | 252 |
| 63" | 21.6 | 1.8 | 18.06 | 64.9 | 108 | 172.8 | 216 | 259.2 | 324 | 432 |

| Media | Wgt./cf | Service Rate GPM perSq.Ft. | Backwash Rate GPM per Sq.Ft. | Bed Depth Inches | Percent Bed Expansion |
|-----------------|-------------|----------------------------|------------------------------|------------------|-----------------------|
| ANTRACITE | 50lbs | 5^ | 12 to 18 | 24" to 36" | 20 to 40% |
| BIRM | 35 to 40LBS | 3.5 to 5 | 10 to 12 | 30" to 36" | 20 to 40% |
| CARBON* | 27 to 30lbs | 8 to 10* | 10 to 12 | 26" to 30" | 30 to 40% |
| CARBON** | 27 to 30lbs | 2 to 4** | 10 to 12 | 26" to 30" | 30 to 40% |
| CALCITE | 100lbs | 3 to 6^ | 8 to 12 | 24" to 30" | 30 to 40% |
| COROSEX | 75lbs | 5 to 8^ | 10 to 12 | 24" to 30" | 30 to 40% |
| CATALOX/PYROLOX | 125LBS | 5 to 10 | 25 to 30 | 18" to 24" | 15 to 30% |
| CHEMSORB | 50lbs | 12 to 20 | 15 to 20 | 24" to 36" | 30 to 40% |
| FILTER Ag | 24 to 26lbs | 5^ | 8 to 10 | 24" to 36" | 20 to 40% |
| GREENSAND | 85lbs | 3 to 5 | 10 to 12 | 30" | 30 to 40% |
| GREENSAND PLUS | 85lbs | 2 to 6^ | 12 | 30" | 30 to 40% |
| KATALOX LIGHT | 66lbs | 6 to 12 | 10 to 12 | 30" to 48" | 30 to 40% |
| KDF | 177lbs | 30 | 30 | 10" | 10 to 15% |
| RESIN CATION | 52lbs | 5 to 7.5 | 3 to 8 | 30" to 36" | 50 to 70% |
| RESIN ANION | 40 to 44lbs | 3 to 5 | 1.5 to 4 | 30" to 36" | 50 to 70% |

^ indicates service rate may be higher depending on conditions

* indicates flow rate for dechlorination applications

** indicates flow rate for organic reduction



The Blake Group

Blake Water Solutions
4 New Park Road
East Windsor, CT 06088
Tel. (860) 243-1491

DISTRIBUTED BY: